

GEAR SHIFTING IS MADE SIMPLE HERE

Expert Explains the Operation in Detail for Benefit of Beginner.

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It does not always pay to be shiftily, but it certainly does when driving the old boat. If one is not very shiftily at times, especially when driving in heavy traffic, there is trouble. "Shiftily" just about describes the operation of the gear lever for it is shift, shift, shift, all the way along some of the crowded streets. Gear shifting probably is the greatest bugaboo of the novice, and illustrations will tell the truth of the old saw "Haste makes waste." It sounds like a paradox, but the fact is that when one wants to speed up it does not mean that you are to speed up the process of speeding up. The tendency of the novice is either to hesitate too much or to go at it slap dash, slam bang. Then there are a variety of sounds from beneath the floor boards, and a grind and clatter which bode evil for the transmission gears, besides making everybody along the highway wonder "what sort of a boob is running that car?"

Because gear shifting is such a bugaboo a great many beginners will do most anything rather than change speed, even running the risk of stalling in traffic, or running around in a block to avoid turning. Now it is not necessary to avoid shifting gears because of any inherent difficulty, or to allow the engine to labor in high instead of shifting to second or first speed in stopping, simply because one is afraid of alarming the neighborhood when starting up again. The wiser way would be to learn how to change speeds noiselessly.

Manufacturers, realizing the reluctance of drivers to change gears, have designed the transmission so that gear shifting is not necessary so often; but when it is necessary to shift it is much more difficult because of this change in design.

The novice who has examined the in-

side of the change speed gear case commonly called the transmission gear, understands that there are several sets of wheels therein, running on parallel shafts and that the meshing together of the several sets makes the difference in speeds. If these gears which engage have the same number of teeth and revolved at the same rate of speed, they would mesh noiselessly and instantly; but they are of varying sizes and have different numbers of teeth, and they do not run at the same rate of speed. The sole trick in shifting gears is to make them revolve at approximately the same speed.

Of course, if one is driving a Ford car, there is a planetary gear set; and there is also the magnetic transmission. With these there is no shifting lever nor meshing of gears. But the majority of change speed gears are of the three speed sliding gear order. It requires, however, some study and much practice to manipulate it noiselessly. One cannot expect to step into a strange car and make a satisfactory shift right off, but there is no reason why the novice should not learn his car's ways quickly and have confidence in handling the levers.

When the car is standing the transmission shaft is at rest, while the gear shaft is revolving at about half the engine's shaft speed. Now if you should try to throw in the first speed gear with the clutch engaged it would make a fine noise. The clutch should always be released and the gear shaft allowed to stop before meshing is attempted; then the clutch is engaged slowly until the car is under way.

To increase the speed the engine should be throttled to bring gear shaft and transmission shaft to about the same speed, hesitating in neutral for a few seconds to permit this. I am not going to tell you how you can know when the speeds are the same. You must find this out by experiment: No two cars are quite alike.

Shifting from second speed to highest speed requires a closed throttle and a longer hesitation in neutral. No gears are to be meshed, but teeth must be engaged to connect engine shaft and transmission shaft and these must approximate in speed. The teeth are built to stand mighty rough use, but a "big noise" and a jump follow when the speed is unequal as they are engaged.

To slow down or stop the car the operation is reversed. Instead of throttling the engine the accelerator is pressed, with the clutch released so that the gear shaft will acquire speed equal to the transmission shaft. Then in dropping from second speed to low speed the engine must be speeded up again, or

the car checked with the brake. To go into reverse the car must be stopped completely with clutch released and lever in neutral. Reverse gears cannot be engaged successfully except when motionless.

If the gears do not mesh in engaging for first speed or reverse, with the lever in neutral engage the clutch gently to change the position of the gear teeth and try again. Try several times, if necessary, for the gear teeth must be in line.

If you are going down the street in heavy traffic and don't want the policeman to yell at you, while others scoff, shift to first speed gear every time you have to stop. Some of the multi-cylinder cars will pick up the load on second or even on high, but your fillyer will not. A little practice will make you shift so easily that you will not mind having to do it frequently.

If you have not seen the inside of the transmission gear case, seek an opportunity to examine just how it works. You can do this at an automobile school, at the show or at a garage. We have a chassis at our school with a glass cover on the transmission case so that it can be seen in operation. An examination of the case will give one a better idea of the operation than is otherwise possible, but it is practice which will make perfect and practice robs the gear shifting of all its terror.

SALE IN NOVEMBER.

Plans Made to Exhibit Fine Cars in the Fall.

Announcement is made of the date of the Automobile Salon of 1920. It will open on the evening of November 14 in the great ballroom of the Commodore, the main room, east and west wings and the big foyer all being used, and will continue through the evening of November 21.

From exhibits already arranged for there is no doubt that this year's annual display of foreign and American motor cars de luxe will be larger than ever before. All of the prominent exhibits of the past two years will again be represented and a number of others, particularly from abroad, are expected to make their salon debut.

Interest in high grade automobile chassis and custom bodies has increased considerably in the past two years, and was shown by the record attendance and sales made at last season's auto salon both in New York and Chicago. With more exhibits, both foreign and domestic, the salon of 1920 should be a notable affair.

PLEASE CONSIDER THE POOR MUFFLER

This Abused and Neglected Part Is Vital to Smooth Operation.

Despised and rejected of men, tucked away back under the car where it is out of sight and out of mind, it is usually the most neglected part of the car. Indeed, it is "cut out" altogether by many just as soon as the traffic cop is left behind. It should not be so. The muffler has a distinct and beneficial purpose and is worthy of careful regard.

Those who have followed this series of articles will remember among the requisites for successful operation of a gas engine after starting are cooling, lubrication and a free exhaust. The latter, unconfined, would be unbearable. The muffler is to muffle the great noise and give a comparatively silent exhaust, at the same time providing for a free escape of the burned gases. Without it there would be no pleasure in riding and the pedestrian and dweller by the roadside would need Maxim silencers on their cars. Those who can remember the days before mufflers were required on cars will bear witness to the necessity.

This is why: In the operation of the engine the exhaust valve opens while the burned gas is yet under a pressure of twenty-five to thirty pounds per square inch. Let directly into the air it would "knock a hole in it" and the report would be deafening. There would be no talking in the car or its vicinity. The muffler provides a chamber where the exhaust gases may expand and likewise cool, thereby lessening the pressure, and by permitting the gases to pass off slowly through a multiplicity of small passages, the exhaust reaches the air quietly instead of a rush and a "big noise."

Early mufflers were rather crude, and while they did quiet the exhaust often it was at a great loss of power because of back pressure. Because of this a cutout was devised, being nothing more than a valve which permitted an exhaust direct into the air, for use in start-

ing or on steep grades or when extra power was necessary. It was almost as much of a nuisance as the open exhaust and speedily cities enacted ordinances forbidding the use of the cutout. Meanwhile manufacturers perfected the muffler to obviate the defects and there was no longer need of the cutout. That is why it is no longer furnished as a part of the regular equipment. There is no longer back pressure.

But it does not follow that back pressure is impossible, for if the muffler be not kept clean the small openings will clog with carbon-soot-from the exhaust. This may become so severe that the engine will be stopped or lose most of its power. The poor grades of gasoline, even at present sky high prices, have a tendency to give off more carbon than the better grades. Particularly would this be true if the carburetor were out of adjustment, permitting an excess of gasoline to enter the cylinders. It is not burned perfectly and causes extra carbon to clog the muffler. Engines which "load up" with gasoline when idling send a fine contribution of soot there, starting off with the black smoke trail behind them.

Clogging of the muffler holes and the back pressure of unescaped gas prevents the cylinders from being emptied of burned gases. This prevents drawing in a full charge of mixture on the intake stroke, the explosion is weak and power lessened. It would be possible to so clog the exhaust that the throttle would be useless; opening it would have no effect. Likewise in starting the first few explosions would choke the exhaust, there would be a sputter and the engine would stop because so little fresh mixture could enter the cylinders. This is the extreme, but we have had cases enough to establish the fact.

In one particular case a car in which the writer was riding could scarce make headway up a slight grade; often second speed was necessary to prevent stalling the engine until someone stepped on the cutout and the car shot ahead. A little experimenting showed that the cutout was a pretty good accelerator, and it was used as such the remainder of the trip. Of course, we knew right off that the muffler was clogged, and when it was taken off it was found to be almost sealed tight by the carbon deposits.

But for the actual opening of the cutout the trouble would have been laid elsewhere. It is natural where there is a decrease of power to blame it on some other cause. One never thinks of the muffler in this connection. As a matter of fact, the manufacturers do not consider it necessary to inspect the muffler

when a car goes into the service station. The inspection card makes no provision for it unless some manufacturer has put a new provision on the card recently. The driver who uses kerosene in the cylinders to get rid of carbon will likely transfer it from cylinder to muffler unless he opens the cutout when running the engine to blow out the kerosene and carbon, for the mixture is nice and soft to plaster over the walls of the muffler and the heat will quickly bake it into a nice enamel, covering holes and walls.

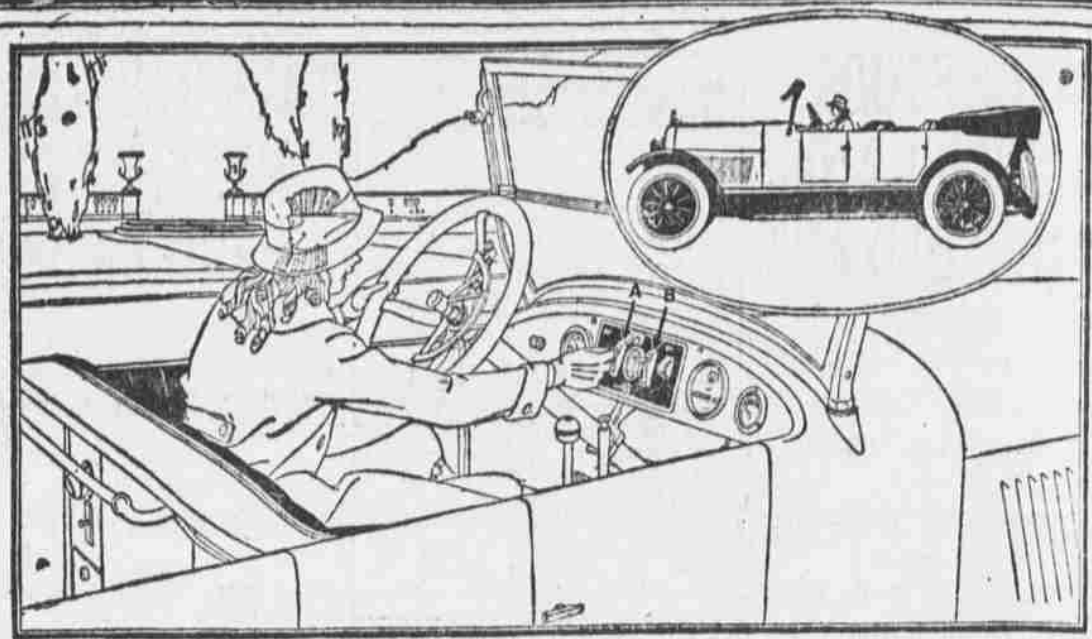
While the muffler on most cars is in

a most inconvenient place to get at, the driver should take it off occasionally and clean it out, or expect eventually to have trouble, and perhaps have it blown off. This is one thing you are not likely to find covered by the manufacturer's instruction book, but it is none the less important.

"DOLLING UP" NICKELLED FITTINGS. Apply regular silver polish to brighten up the nickel-plated parts of the car. Rub the polish on and off with soft cloths and note the result.

CLEANING LEATHER UPHOLSTERY. Don't use gasoline to clean leather unless you want to crack it. Plain water with a few drops of ammonia will remove the dirt. After which the upholstery should be rubbed briskly with a soft cloth. An excellent leather dressing is made by combining two parts of linseed oil to one of turpentine.

ONE "MISSING" MYSTERY LESS! A common yet at the same time mysterious cause of an engine misfiring explosion is water in the carburetor. When trying other causes of stalling try draining the carburetor. Close some of the fuel in the hand and note if globules form on top. They reveal the presence of water.



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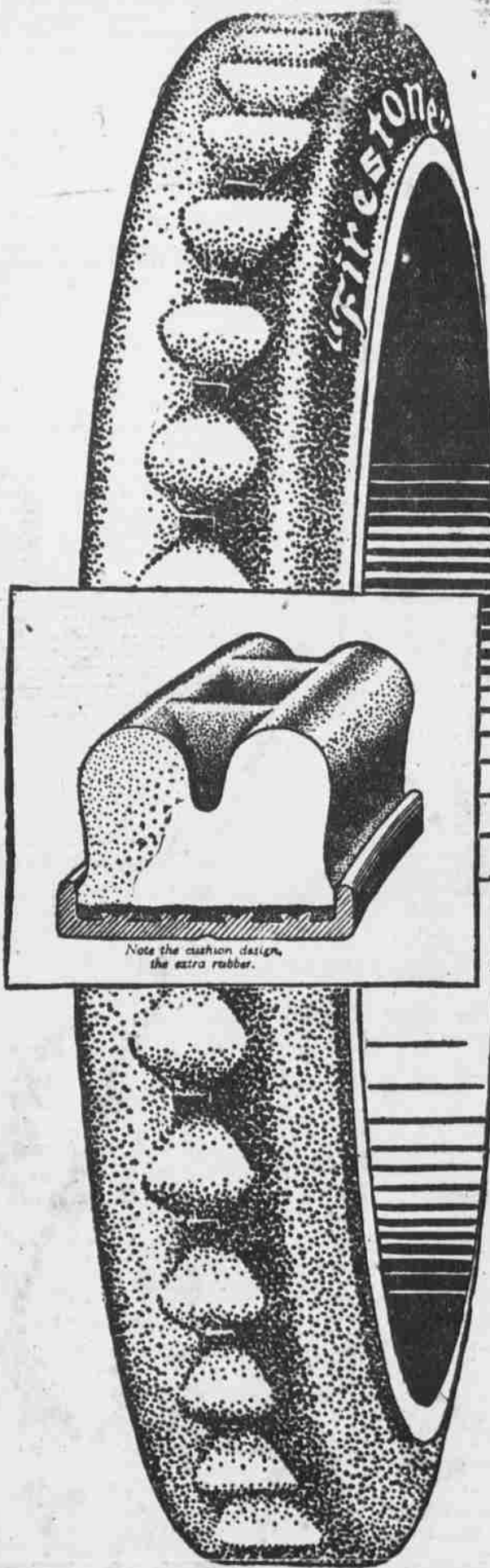
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